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INF3705 (492368) October/November 2016

ADVANCED SYSTEMS DEVELOPMENT

Duration 2 Hours

100 Marks

Examiners

First	Prof A Coleman
Second	Dr V Horner
External	Prof R Kekwaletswe

Closed book examination.

This examination question paper remains the property of the University of South Africa and may not be removed from the examination venue.

This examination question paper consists of 6 pages plus instructions for the completion of a mark-reading sheet

INSTRUCTIONS

1 This paper is made up of 2 sections, A and B

2 Answer section A on the mark-reading sheet, and the rest of the questions in the answer book

3 All rough work must be done in the answer book

4 The mark for each question is given in brackets next to the question

5 Please answer the questions in the order in which they have been set If you wish to leave out a question temporarily and come back to it later, leave sufficient space for it in your answer book

6 Section A constitutes 50 marks and Section B, 50 marks

TURN OVER

SECTION A MULTIPLE-CHOICE QUESTIONS [50 MARKS]

1 Refactoring which is making program changes to preserve a system functionality, is a form of _____

    1 Preventative maintenance
    2 Maintenance to repair software faults
    3 Maintenance to adapt software to a different operating environment
    4 None of the above

2 The agile model of software development is most appropriate for the following situation

    1 When developments methods are flexible
    2 When the process of software development is well defined
    3 When requirements are well known in advance
    4 All of the above

3 Which of the following needs to be assessed during unit testing?

    1 Algorithmic performance
    2 Code stability
    3 To test during development
    4 All of the above

4 What is the purpose of load testing?

    1 To test the response rate of the system
    2 To test the number of transactions that the system can handle simultaneously
    3 To test during development
    4 All of the above

5 The purpose of performance testing is to_____

    1 To test the response rate of the system
    2 To test the number of transactions that the system can handle simultaneously
    3 To test during development
    4 All of the above

6 Usability testing involves the following

    1 Deployment testing
    2 Requirements validation
    3 Load testing
    4 All of the above

7 As a system developer, which of the following are elements to be considered in systems design?
  1 Architecture, data and interfaces
  2 Data interfaces and project scope
  3 Systems models
  4 All of the above.

8 Which of the following are concerns to be addressed during software engineering practice?

  1 Architecture, data and interfaces
  2 Data interfaces and project scope
  3 Systems models
  4 All of the above

9 An architectural style encompasses which of the following elements?

  1 Constraints
  2 Set of components
  3 Semantic models
  4 All of the above

10 To determine the architectural style or combination of styles that best fits the proposed system, requirements engineering is used to uncover _____

  1 Algorithmic complexity
  2 Characteristics and constraints
  3 Control and data
  4 Design patterns

11 Which of the following are elements of systems requirements?

  1 Architecture, data and interfaces
  2 Data, interfaces and project scope
  3 Systems models
  4 All of the above

12 Which of the following is preferable of software modules?

  1 Low cohesion and high coupling
  2 High cohesion and high coupling
  3 High cohesion and low coupling
  4 It depends on the situation

13 Cyber security dealing with secrecy or confidentiality threats is referred to as __

  1 Unauthorised modification of data
  2 Denial of access to data and services
  3 Unauthorised viewing of data
  4 All of the above

3

14 Integrity threats refer to one of the following

1 Unauthorised modification of data
2 Denial of access to data and services
3 Unauthorised viewing of data
4 All of the above

15 Denial of access or availability threats refer to as _____

1 Unauthorised modification of data
2 Denial of access to data and services
3 Unauthorised viewing of data
4 All of the above

16 Which of the following can be classified as true of the Model–View-Controller (MVC) architectural pattern?

1 It has three components
2 Has clients and servers
3 It is a sequential model of processing
4 None of the above

17 Prototyping involves development of _____

1 Initial demonstration of concepts
2 A final product
3 A stable product
4 Beta version of the product

18 Which of the following is an attribute of a dependable software engineering process?

1 Documentable
2 Standardised
3 Auditable
4 All of the above

19 Redundancy and diversity are fundamental strategies in the dependability of a system Which of the following is an example of diversity?

1 A spare/extra capacity
2 Object oriented design
3 Avoiding a single point of failure
4 All of the above

4

20 Which of the following exploits on reusable components in its design?

   1 A backup mechanism
   2 Object oriented design
   3 Avoiding a single point of failure
   4 All of the above

21 Socio -Technical systems are made up of different components including_____

   1 Equipment
   2 Operating system
   3 Society
   4 All of the above

22 Which of the following influences the reliability of a system?

   1 Hardware reliability
   2 Software reliability
   3 Operator reliability
   4 All of the above

23 Which of the following is not part of software engineering ethics?

   1 Confidentiality
   2 Competence
   3 Intellectual property rights
   4 None of the above

24 Why is it sometimes necessary to bypass the normal change management system and make urgent change to a system?

   1 To satisfy management
   2 To satisfy customer
   3 To repair a serious system fault
   4 None of the above

25 Which of the following factors is not used to assess a systems applications evolution?

   1 Documentation
   2 Data
   3 Performance
   4 Skills

5

SECTION B STRUCTURED QUESTIONS   [50 MARKS]

QUESTION 1   [10]

You have been employed as a system developer in Q systems Explain to your
new team members the following process activities, specification, validation and
evolution

QUESTION 2   [10]

Members of your software development team think that agile methods should
be based on principles Explain the principles of agile methods to the team

QUESTION 3   [10]

The essential difference of any software product development is important to both
the customer and the developer

QUESTION 3 1   (5)

What are the fundamental concepts of user and system requirements?

QUESTION 3 2   (5)

State three rationale why these requirements should be written in different ways?

QUESTION 4   [10]

As a system developer, your organisation requires you to make a decision on
system architecture Explain to your organization members what decisions
have to be made about the system during the architectural design process?

QUESTION 5   [6]

Development testing forms an integral aspect of system development
Explain the following, unit testing, component testing and system testing
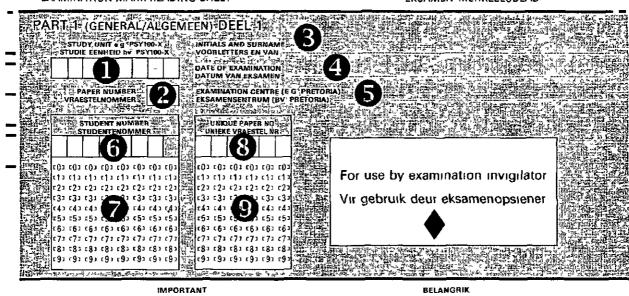
QUESTION 6   [4]

Software dependability is very important in most socio-technical systems
Describe any four importance of system dependability

6

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EXAMINATION MARK READING SHEET EKSAMEN-MERKLEESBLAD

PART 1 (GENERAL/ALGEMEEN) DEEL 1

STUDY UNIT e g PSY100-X
STUDIE EENHEID bv PSY100-X ❶

PAPER NUMBER
VRAESTELNOMMER ❷

INITIALS AND SURNAME
VOORLETTERS EN VAN ❸

DATE OF EXAMINATION
DATUM VAN EKSAMEN ❹

EXAMINATION CENTRE (E G PRETORIA)
EKSAMENSENTRUM (BV PRETORIA) ❺

STUDENT NUMBER
STUDENTENOMMER ❻ ❼

UNIQUE PAPER NO
UNIEKE VRAESTEL NR ❽ ❾

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For use by examination invigilator

Vir gebruik deur eksamenopsiener

◆

IMPORTANT

1. USE ONLY AN HB PENCIL TO COMPLETE THIS SHEET
2. MARK LIKE THIS ➡
3. CHECK THAT YOUR INITIALS AND SURNAME HAS BEEN FILLED IN CORRECTLY
4. ENTER YOUR STUDENT NUMBER FROM LEFT TO RIGHT
5. CHECK THAT YOUR STUDENT NUMBER HAS BEEN FILLED IN CORRECTLY
6. CHECK THAT THE UNIQUE NUMBER HAS BEEN FILLED IN CORRECTLY
7. CHECK THAT ONLY ONE ANSWER PER QUESTION HAS BEEN MARKED
8. DO NOT FOLD

BELANGRIK

1. GEBRUIK SLEGS N HB-POTLOOD OM HIERDIE BLAD TE VOLTOOI
2. MERK AS VOLG ➡
3. KONTROLEER DAT U VOORLETTERS EN VAN REG INGEVUL IS
4. VUL U STUDENTENOMMER VAN LINKS NA REGS IN
5. KONTROLEER DAT U DIE KORREKTE STUDENTENOMMER VERSTREK HET
6. KONTROLEER DAT DIE UNIEKE NOMMER REG INGEVUL IS
7. MAAK SEKER DAT NET EEN ALTERNATIEF PER VRAAG GEMERK IS
8. MOENIE VOU NIE

PART 2 (ANSWERS/ANTWOORDE) DEEL 2

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